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EXAMINER	
MOORE, SUSANNA	

ART UNIT	PAPER NUMBER
1624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/542,940	TERRICABRAS BELART ET AL.	
	Examiner	Art Unit	
	SUSANNA MOORE	1624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 May 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12,14 and 18-22* is/are pending in the application.

4a) Of the above claim(s) *12 and 18-22* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-10 and 14* is/are rejected.

7)☒ Claim(s) *7 and 11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant continues to argue the traversal of the restriction requirement by stating, "Foremost, Applicants point out that the response to the Restriction Requirement made it clear that "the special technical feature linking the claims is not limited to the [4- aminothieno[2,3-d]pyrimidine-6-carbonitrile core], but rather encompasses the position and identity of the radicals R1 to R4, which are also part of the structure of compounds of formula (I)." This is not persuasive. Just as Applicant previously acknowledged, the special technical feature "is that of 4-aminothieno[2,3-d]pyrimidine-6-carbonitrile compounds, as seen by the title of the application and the structure of compounds of formula (I) set forth in the instant claims." The Examiner found the core which Applicant indicated as the special technical feature but Applicant now wants to further narrow the special technical feature and include variables. Variables are not part of the special technical feature since they vary from one compound to another. The requirement is still deemed proper and is therefore made **FINAL**.

There are 18 claims pending and 12 under consideration. Claims 1-11 are compound claims. Claim 14 is a composition claim. Claims 12 and 18-22 are method of using claims, process of making and complex compositions claims, which are currently withdrawn from consideration. This is a Final Office Action. The application concerns some thieno[2,3-d]pyrimidine compounds and simple compositions thereof.

Applicant is reminded of 37 CFR 1.475, which states the following:

Unity of invention before the International Searching Authority, the International Preliminary Examining Authority and during the national stage.

… (b) An international or a national stage application containing claims to different categories of invention will be considered to have unity of invention if the claims are drawn only to one of the following combinations of categories:

(1) A product and a process specially adapted for the manufacture of said product; or

(2) A product and a process of use of said product; or

(3) A product, a process specially adapted for the manufacture of the said product, and a use of the said product; or

(4) A process and an apparatus or means specifically designed for carrying out the said process; or

(5) A product, a process specially adapted for the manufacture of the said product, and an apparatus or means specifically designed for carrying out the said process.

(d) If multiple products, processes of manufacture or uses are claimed, the first invention of the category first mentioned in the claims of the application and the first recited invention of each of the other categories related thereto will be considered as the main invention in the claims, see PCT Article 17(3)(a) and § 1.476(c).

If Applicant would like rejoinder of the process claims and the method claims, Applicant is entitled to elect a single disclosed method, not multiple methods. Applicant has already elected a product. Furthermore, there is only one process claim.

Claim Objections

The objection of claims 1 and 10 for the term "alcoxycarbonyl" is withdrawn based on the amendments.

The objection of claim 1 for the phrase "alkyl and alkylene groups, wherein each alkyl and alkylene ,group is independently optionally substituted by one or more substituents chosen from halogen atoms" is withdrawn.

Claims 7 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 12 and 18-22 are objected to because of the following informalities: this application contains claims 12 and 18-22, drawn to an invention nonelected with traverse. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144). See MPEP § 821.01. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The rejection of the term "acyl" is withdrawn based on the remarks submitted by Applicant.

The rejection of claim 2 for the recitation of the limitation "wherein each C_1-C_4alkyl group is independently…substituted by one hydroxyl group" is withdrawn based on the remarks by Applicant.

The rejection of claim 11 for the R_3 variable in the following species, page 14, specie 3, 4 and 8-11 is withdrawn based on the amendments.

Claim 4 recites the term "dialkylamino" in the definition of R_2. There is insufficient antecedent basis for this term in the claim 4.

Applicant traverses the above rejection by stating, "Applicants respectfully traverse this rejection for at least the reason that claim 1, from which claim 4 depends, recites that R_2 can be chosen from "alkyl, alkenyl, and alkynyl groups, wherein each alkyl, alkenyl and alkynyl group is independently optionally substituted by one or more substituents chosen from halogen atoms ... and mono- and di-alkylamino groups." This is true. However, claim 4, is not drawn to a substituted alkyl, alkenyl or alkynyl but a dialkylamino group for R_2. Thus, the rejection is maintained.

Applicant is enabled for R4= alkyl and aryl based on the GB 1454529 reference.

Claims 1-6, 8-10 and 14 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for compounds of Formula 1, wherein R_4= methyl does not reasonably provide enablement for compounds of Formula 1, wherein R_4 is H, an optionally substituted hydrocarbon group other than methyl or any aryl group. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

Pursuant to *In re Wands*, 858 F.2d 731,737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988), one considers the following factors to determine whether undue experimentation is required: (A) The breadth of the claims; (B) The nature of the invention; (C) The state of the prior art; (D) The level of one of ordinary skill; (E) The level of predictability in the art; (F) The amount of direction provided by the inventor; (G) The existence of working examples; and (H) The quantity of experimentation needed to make or use the invention based on the content of the disclosure. Some experimentation is not fatal; the issue is whether the amount of experimentation is "undue"; see *In re Vaeck*, 20 USPQ2d 1438, 1444.

The analysis is as follows:

(A) Breadth of claims: Scope of the compounds. Owing to the range of many variables, thousands of substituted thieno[2,3-d]pyrimidines are embraced.

Applicant states, "Applicants respectfully assert that formula (I) is a genus of compounds for which several representative species are disclosed in the specification. This type of representation is widely used in patents disclosing similar genus-species relationships. The mere

fact that the claimed formula (I) represents multiple chemical species does not by itself support lack of enablement of the claims. See, e.g., M.P.E.P. § 2164.08."

This is true, however, each Application must be enabled and is taken on its own merits.

(B) The nature of the invention: The invention is a highly substituted thieno[2,3-d]pyrimidines.

(C) Level of predictability in the art: It is well established that "the scope of enablement varies inversely with the degree of unpredictability of the factors involved," and physiological activity is generally considered to be an unpredictable factor. See *In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970).

Applicant states, "However, the relationship between PDE-7 inhibition and treatment of various diseases and disorders is well documented. See, e.g., specification at paragraph [0008]. Thus, the level of predictability in the art, with respect to PDE-7 inhibition and treatment of, for example, T cell mediated immune diseases, is such that the effect of PDE-7 inhibition is well known in the art and can be expected from compounds that exhibit PDE-7 inhibition."

This is not the issue at hand. The enablement is based on the synthesis and starting materials, not the pharmacology.

(D) Direction or Guidance: That provided is very limited. Applicant shows a general synthesis of compounds of Formula 1, under Preparation on pages 26-27 of the Specification, but does not show the starting material used to make the variety of compounds claimed. There is limited evidence in the Specification of the example compounds that only cover a small portion of the

substituents claimed of Formula 1. Thus, there is no specific direction or guidance regarding said compounds of Formula 1 specifically mentioned in Scope.

The specification does not provide any support for the synthesis of compounds of Formula 1, wherein R_4 is H.

The availability of the starting material that is needed to prepare the invention as claimed is at issue here...As per MPEP 2164.01 (b). A key issue that can arise when determining whether the specification is enabling is whether the starting materials or apparatus necessary to a make the invention are available. In the biotechnical area, this is often true when the product or process requires a particular strain of microorganism and when the microorganism is available only after extensive screening. The Court in *In re Ghiron*, 442 F.2d 985, 991,169 USPQ 723, 727 (CCPA 1971), made it clear that if the practice of a method requires a particular apparatus, the application must provide a sufficient disclosure of the apparatus if the apparatus is not readily available. The same can be said if certain chemicals are required to make a compound or practice a chemical process. *In re Howarth*, 654 F.2d 103, 105, 210 USPQ 689, 691 (CCPA 1981).

Applicant cited the GB 1454529 reference which is enabling when R_4 methyl and aryl. The reference is not enabling for when R_4 is hydrogen.

(E) State of the Prior Art: These compounds are substituted thieno[2,3-d]pyrimidines of Formula I wherein R_4= methyl and aryl, which are well documented in the art.

Applicant states, "Indeed, Applicants highlight the fact that the Examiner has not provided a single example of the supposed documentation indicating that the invention is anticipated." This is true but not required.

(F) Working Examples: Applicant shows example 1-135 but no working examples were shown of Formula I wherein R_4 is H.

Applicant goes on to state, "In the present case, the 135 examples disclosed in the specification more than suffice a finding of enablement." The number of examples is not an indicator of enablement, although this is factor which is considered under the Wands analysis.

(G) Skill of those in the art: The ordinary artisan is highly skilled.

(H) The quantity of experimentation needed: Since there are very limited working examples as described above, the amount of experimentation is expected to be high and burdensome.

Applicant further recites, "The mere fact that some experimentation may be required to synthesize specific compounds of the invention from the general teachings therein does not compel a finding of lack of enablement. See *Johns Hopkins Univ. v. CellPro, Inc.*, 152, F.3d 1342, 1360-61,47 U.S.P.Q.2d 1705, 1719 (Fed. Cir. 1998).

Again, this is true, however, when the Wands analysis is taken as a whole, it is determined the instant Application is not enabled for R_4= hydrogen.

Due to the level of unpredictability in the art, the very limited guidance provide, and the lack of working examples, the Applicant has shown lack of enablement for the groups noted groups on Formula i. MPEP 2164.01(a) states, "A conclusion of lack of enablement means that, based on the evidence regarding each of the above factors, the specification, at the time the

application was filed, would not have taught one skilled in the art how to make and/or use the full scope of the claimed invention without undue experimentation. *In re Wright*, 999 F.2d 1557, 1562, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993)." That conclusion is clearly justified here.

The mere recitation of a substituent as part of a Markush group does not provide enablement. Thus, the rejection is maintained. **Applicant is enabled for R4= alkyl and aryl based on the GB 1454529 reference.**

Claim Rejections - 35 USC § 103

The rejection of claims 1, 5-10 under 35 U.S.C. 103(a) as being unpatentable over Umeda et. al. (EP 1329454) is withdrawn.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SUSANNA MOORE whose telephone number is (571)272-9046. The examiner can normally be reached on M-F 8:00-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. James O. Wilson can be reached on (571) 272-0661. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Susanna Moore/
Examiner, Art Unit 1624

/James O. Wilson/

Supervisory Patent Examiner, Art Unit 1624